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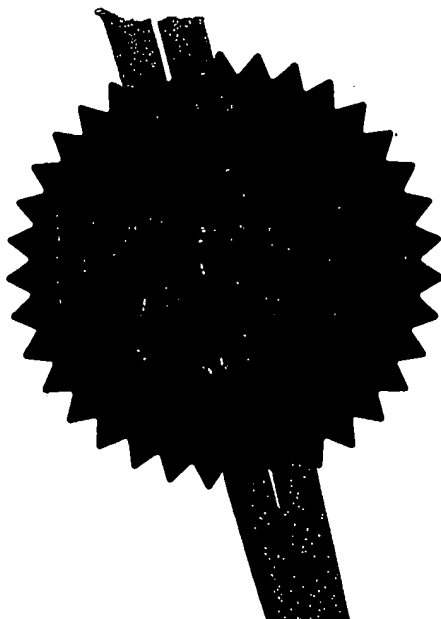
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*P. Mahoney*

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THE PATENT OFFICE

15 JUL 2000

**Request for grant of a patent**

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No Fee

The Patent Office

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1. Your reference RBT/P300610GB 17JUL00 E553036-3 C03126  
P01/7700 0.00-0017307.0

2. Patent application number 0017307.0 15 JUL 2000  
(The Patent Office will fill in this part)

3. Full name, address and postcode of the or of each applicant (underline all surnames)  
Supreme Plastics Group Ltd  
Supreme House  
300 Regents Park Road  
London N3 2TL

Patents ADP number (if you know it)

7283518001

If the applicant is a corporate body, give the country/state of its incorporation

United Kingdom

4. Title of the invention Methods of and apparatus for sealing zipper to a substrate

5. Name of your agent (if you have one) W. P. Thompson & Co.  
"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)  
Eastcheap House, Central Approach  
Letchworth  
Herts SG6 3DS

Patents ADP number (if you know it)

158003

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (if you know it) the or each application number

Country	Priority application number (if you know it)	Date of filing (Day/month/year)

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application	Date of filing (Day/month/year)

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (Answer 'yes' if:  
a) any applicant named in part 3 is not an inventor, or  
b) there is an inventor who is not named as an applicant, or  
c) any named applicant is a corporate body.  
See note (d))

Yes

## Patents Form 1/77

9. Enter the number of sheets for any of the following items you are filing with this form. Do not count copies of the same document

Continuation sheets of this form

Description 5

Claims

Abstract

Drawing(s) 1+1

10. If you are also filing any of the following, state how many against each item.

Priority documents

Translations of priority documents

Statement of inventorship and right to grant of a patent (*Patents Form 7/77*)

Request for preliminary examination and search (*Patents Form 9/77*)

Request for substantive examination (*Patents Form 10/77*)

Any other documents  
(Please specify)

11. We request the grant of a patent on the basis of this application

Signature

Date July 14, 2000

W P Thompson & Co  
W. P. Thompson & Co.

12. Name and daytime telephone number of person to contact in the United Kingdom Roger B Thomson  
01462 682139

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METHODS OF AND APPARATUS FOR SEALING ZIPPER TO A SUBSTRATE

This invention relates to methods of and apparatus for sealing reclosable fasteners, otherwise known as zippers, to a web or film, in the manufacture of plastics bags and other containers.

The invention is particularly concerned with the sealing of zippers on form/fill/seal machines, vertical or horizontal, and more especially where the zipper is applied to the substrate using cross-web techniques.

10 When a zipper strip is applied to a film or web, heat and pressure are applied to effect the welding of the zipper to the film or web. The heat and/or the pressure can result in damage to the closure. Various measures have been adopted to try to minimise the effects of the heat and pressure. For  
15 example, the welding can be of flanges extending laterally from the reclosable male and female elements, to try to minimise damage to the closure. However, it can still happen that the zipper is damaged or distorted as a result of these external influences.

20 Our UK patent application 0016894.8 describes a novel zipper whose design is resistant to distortion or damage due to the welding heat and/or pressure.

In this design there is provided a reclosable fastener for plastics bags and other containers, comprising two  
25 elements, each element comprising at least one hook engageable with a hook of the other element, and each element comprising an upstanding post at the margin of the fastener which is engageable with a heel of the other element at the opposing margin of said other element, wherein the respective posts and  
30 heels of the two elements are angled at their respective contact surfaces.

The fact that the respective contact surfaces of the posts and heels are angled or mitred enables the closure more easily to resist pressure without distortion and without the hooks being squashed. The margins of the closure are more  
5 easily able to resist bending and to maintain their desired supporting function.

In accordance with the present invention there are provided methods of and apparatus for sealing such a zipper to a substrate by the use of sealing jaws.

10 With this method the sealing of the full zipper profile to the substrate is effected within the jaw area. This is in contrast to other known methods where zipper flanges only are sealed to the substrate in this area.

An advantage of this method is that because of the zipper  
15 design, with the mitred posts and heels, and the consequent resistance to distortion, a smaller zipper profile can be used and the bars of the sealing jaws can be relatively large. The relatively small height of the profile and the use of gripper bars means that the web or film forms around the zipper  
20 profile and does not cause heat marks on the web or film. This allows a greater degree of bag length variation in the host unit.

In order that the invention may be more fully understood, one presently preferred embodiment of method and apparatus in  
25 accordance with the invention will now be described by way of example and with reference to the accompanying drawing which is a schematic cross-sectional view through the apparatus and zipper.

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Referring to the drawing, there is shown a zipper,  
30 indicated generally at 10, comprising a first element 12 and a second element 14. The two elements 12 and 14 are generally

the same as each other, apart from the fact that element 12 is provided with a single elongate flange 16. Each element 12, 14 comprises a body portion 18 with two upstanding legs 20 which terminate in hooks 22. The respective hooks 22 of the two elements 12 and 14 are interengageable to make the reclosable fastener.

Each element 12, 14 also comprises an upstanding support post 24 at one margin. The support post 24 is slightly longer than the hooked legs 20, 22 so that it extends slightly beyond the tops of the legs. The upper end surface 26 of each post 24 is tapered to provide an angled contact surface. Facing each support post 24, on the opposing element, there is provided a heel portion 28, again at the margin. The surface of each heel portion 28 facing the respective post 24 is shaped to be complementary to the angled contact surface 26. As can be seen from the drawing, with this arrangement, the respective posts and heels nest with one another to provide a shape-locking configuration which tends to resist squashing or outward bending under vertical loads. The angled contact surfaces are able to absorb the welding pressure and maintain their linear integrity, thus preventing the hooked legs 20, 22 from being squashed or distorted.

In order to reduce the effects of the welding heat, each of the closure elements 12 and 14 is provided with a pair of thickened areas 30 on the outside face remote from the legs 20. The respective thickened areas 30 are provided again at the margins of the closure, in alignment with the posts 24 and heel portions 28. The thickened areas 30 are provided by a thickening of the material of which each of the two elements is composed. Because of the additional bulk provided by the thickened areas 30, they also contribute to the resistance of

the closure to deformation due to pressure. On each thickened area 30 there is provided a layer 32 of a material which is a high-performance sealing/welding material or blend of materials, such as EVA for example. This facilitates the welding of the zipper to the adjacent web or film 34. The layers 32 are co-extruded with the closure elements 12 and 14.

The single long flange 16 which is part of element 12 is arranged to face the inside of the web or film 34 on one side of the bag.

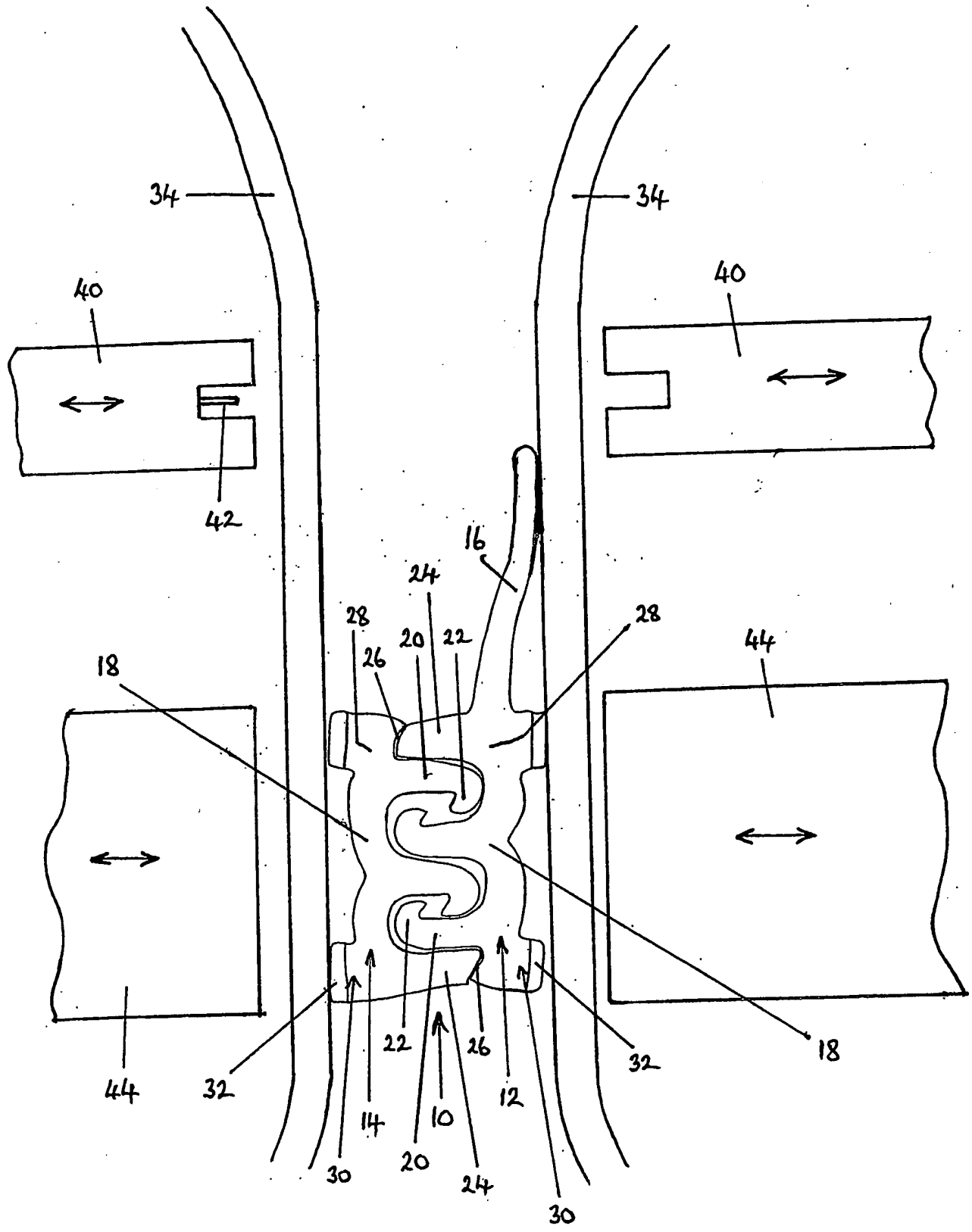
10 In the method of manufacturing a plastics bag or other container on an FFS machine, lengths of zipper 10 are presented to a continuous web or film 34 by a cross-web technique and initially are welded just by the single flange 16 to the inside surface of one web 34. The partially formed 15 bag carrying the zipper strip then passes through a first pair of sealing jaws 40, one of which incorporates a knife blade 42 whose purpose is to sever the filled and sealed bags.

Following the jaws 40 is a second pair of sealing jaws 44 which are displaceable towards and away from the path along 20 which the partially formed bag travels. The jaws 44 are relatively large and the zipper 10 is relatively small and compact. Therefore, the film 34 forms around the zipper profile when the sealing jaws 44 move inwards, without causing heat marks on the film.

25 The jaws 44 may be of any suitable design and form. They can for example be of the type described in our application GB9924344.6 where each jaw has a plurality of spaced heat sealing wires, with a plurality of pressure switches associated with the wires and operable when pressure is 30 imparted thereto to heat the wires. Alternatively, they can be flat-surface jaws heated by appropriate means. The welding

of the film 34 to the zipper is effected by a suitable combination of the parameters of heat, pressure and time.





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